

Closed Loop Students Monitoring And Tracking System Using Raspberry Pi

Dhivya.A¹, Pravin Kumar.S², Roja.M³, Jayaprakash .B⁴, Naveen Kumar.P⁵

^{1, 2, 3, 4} UG Student, Department of Electrical and Electronics Engineering, Knowledge Institute of Technology, Salem-637504

⁵Assistant Professor, Department of Electrical and Electronics Engineering, Knowledge Institute of Technology, Salem-637504

Abstract- In the modern world people work hard to earn money and to live a sophisticated life. Parents are worried to ensure that their child is 100percent safe when they leave the steps out. Many papers addressed this issue in different ways such as by passing information through SMS comprising of GSM and RFID. The existing system shares the location and images of the environment in case of emergencies only such as accidents, break down, fire accidents to the relevant authorities. Taking this problem as a concern we propose a new innovative and smart idea for ensuring the safety of the child. This is a full duplex communication system comprising of RFID, Raspberry pi which is integrated with Internet of Things (IOT). It sends the information to their parents as soon as the child reaches or leaves the school. In case of any problems or the child does not reached the home/school within a particular time then the system proactively questions the school authority/parents and sends GPS location to the parents as well as the school.

Key words: Student monitoring, Raspberry pi, Bi direction communication, Database.

1. INTRODUCTION

In today's world, ensuring safety and security has been one of the major concerns. Especially when it comes to children, parents, organization like school are way more concerned and worried to ensure that their child is 100 percent safe when he leaves his steps out. With technology advancements, we would like to highlight a new step being taken for ensuring the safety of children outside. The RFID technology locates the child position GSM will pass information about child to his or her parents only. It will receive the SMS/Email from the system that inform their children only enter/exits from bus. It works in case of emergencies only such as accidents, break down, fire accidents by immediately sharing the location and images of the inside environment of the bus to the school authorities. It consists of two sides out of them one is parent module and another is the child module. There are two android mobile phones for the safety of the both module. It gives missing child tracking option by student ID cards flexible for both parents, organization.

2. LITERATURE REVIEW

As per the Implementation of Children Tracking System on Android Mobile Terminals J.Saranya, J.Selvakumar describes that children information is transmitted and received using GSM technology. The Child module acts as a transmitter which includes Arm7 microcontroller, GSM module, GPS module and Voice playback circuit. The receiver module includes Android phone and monitoring database. Child module is fixed to each and every child. The position of the moving child is tracked by GPS and is sent to ARM7 microcontroller. When the child cries, voice playback circuit is triggered by ARM7 microcontroller and intimation about corresponding child is given through text message to their parents.

As per the RFID Based School Children Monitoring System, Panaskar Prajakta.R, Patel Karishma M al describes that the system which consists of main units as a bus unit. The bus unit system is used to detect when a child enters/exits from the bus. Childs information at entry/exit level will be recorded automatically when they pass by the scanner. At the same time parents will automatically receive the SMS from the system that inform their children enter/exits from bus. Also information of students will be displayed on LCD display. This system will benefit to parents, school children's and school administrator. This system will be also promising to enhance the safety of child during daily transportation.

As per the School Bus Monitoring System Using Raspberry Pi, R.Abhishek, K.Goutamial describes about the system which is intended to play an important role in real time monitoring and also intended to provide safety and secure solution to the students and parents. An SMS alert is sent to the parents whenever their child boards the school bus and also when the child is dropped from school at the dropping point. Whenever there is school bus accident, the system provides the condition of students by an E-mail and SMS alert. The E-mail alert is provided along with the images of the internal environment in the school bus, and the location of emergency. An alert message is sent to the school authority if the school bus driver carries out rash driving at any point of time.

3. EXISTING METHOD

In existing system, a low-cost Radio Frequency Identification (RFID) has been implemented. RFID is a technology which is used as an alternative for manual scanning in order to detect human beings plugged with RFID tag. It also provides a panic switch and two keys. Panic switch is used in case of emergency and keys are used if the vehicle gets stuck in traffic and also in case if vehicle break downs. On pressing the mentioned buttons, an image of the inside environment of the school bus along with the co-ordinates of the location will be mailed and also a message will be sent to the school authorities and parents Hall Effect sensor.

For tracking the vehicle using GPS and maintain its database, MySQL database system is used along with advanced feature of Raspberry-Pi. In the database base monitoring and updating mechanism. Date, Speed, Time at which the vehicle was tracked and store into the database of Raspberry Pi.

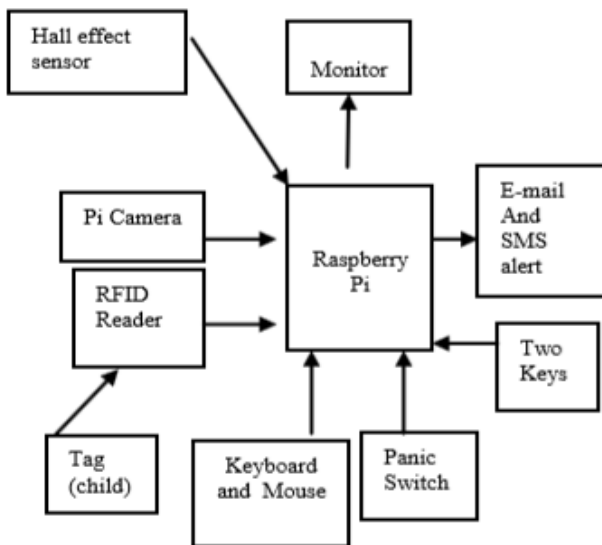


Fig.1 Existing Block Diagram

4. PROPOSED METHOD

4. 1. FUNCTIONAL BLOCK DIAGRAM

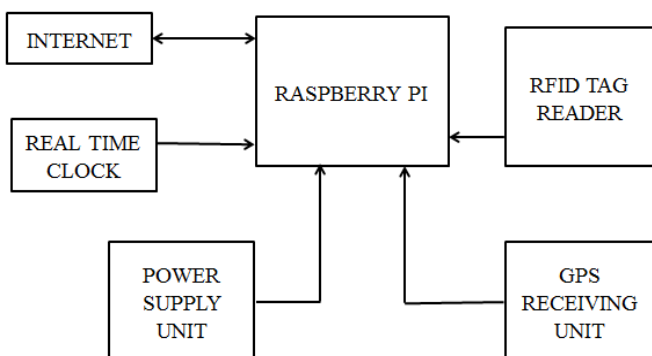


Fig.2 Proposed Block Diagram for Master

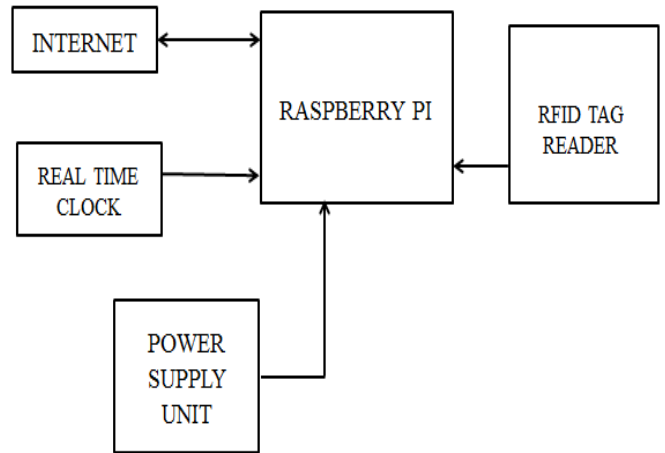


Fig.3 Proposed Block Diagram for Master 2

4. 2. Description Of Proposed Method And Its Functional Units

The block diagram shows how the raspberry pi works. It shows how the system circuit works and how the current flow goes through it. The proposed system includes sensors, control unit, Bluetooth, Wireless network and supply unit. Bluetooth is used for transferring data and message. All of these sensors are directly connected to the Raspberry Pi 3B Module which has their own default program according to their use. The working energy for the kit is obtained from the battery connected to the raspberry pi microprocessor.

The main aim of this project is monitoring the children and screening the timing they reach home. RFID is used for detecting ID card of the children and GPS tracking is used for detecting the latitude and longitude of children when they are in trouble. It is transmitted through wireless network to the parents mobile.

4. 3. Raspberry PI 3B

The Raspberry Pi is a credit-card-sized computer that plugs into your TV and a keyboard. It is a capable little computer which can be used in electronics projects, and for many of the things that your desktop PC does, like spreadsheets, word processing, browsing the internet, and playing games. It also plays high-definition video. We want to see it being used by adults and children all over the world to learn programming and digital making.

4. 4. GPS

GPS is a multiple – satellite based radio positioning system in which each GPS satellite transmits data that allows user to precisely measure the distance from the selected satellite to his antenna and to compute position, velocity and time parameters to high degree of accuracy GPS delivers with high sensitivity and accuracy with low power consumption. GPS module design is flexible to accommodate various RF interference.

4. 5. RFID Module

Each student is housed with RF identity card. The indentifying information stored in the microchip transmits to the RFID reader using an antenna. RFID reader is equipped at the entrance and exit gate of the bus. The reader will communicate to the Raspberry PI microprocessor serially using the line driver MAX 232 to verify the threshold value.

4. 6. Real Time Clock

The Raspberry Pi is designed to be an ultra-low cost computer, so a lot of things we are used to on a computer have been left out. For example, your laptop and computer have a little coin-battery-powered 'Real Time Clock' (RTC) module, which keeps time even when the power is off, or the battery removed. To keep costs low and the size small, an RTC is not included with the Raspberry pi. Instead, the Pi is intended to be concerned to the Internet via Ethernet or Wi-Fi, updating the time automatically from the global ntp (network time protocol) servers

5. CONCLUSION

The project is intended to be designed using structured modeling to provide the desired results. Different technologies have different methodologies to implement the monitoring of school bus, more precisely safety of children in school bus. The proposed system is intended to play an important role in real time monitoring and also intended to provide safety and secure solution to the students and parents. An SMS alert is sent to the parents whenever their child boards the school bus and also when the child is dropped from school at the dropping point using GPS module. An alert message is sent to the school authority as well to parents.

REFERENCE

- [1] R.Abhishek,K.Goutami, K.R.Gurudath, M.Nesarand S.R.Deepa5; "School Bus Monitoring System Using Raspberry Pi", Asian Journal of Computer Science and Technology ISSN: 2249-0701 Vol. 6 No. 2, 2017
- [2] TRita H. Pawade, Dr. Arun N. Gaikwad; "Android Based Children Tracking System", International International Journal of Science, Engineering and Technology Research (IJSETR), Volume 4, Issue 6, June 2015
- [3] PanaskarPrajakta R, Patel Karishma M, Mote Shital P, Kale Aniket V; "RFID Based School Children Monitoring System", International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 1, January 2016